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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,585	01/25/2007	Masato Kobayakawa	Q80399	3393
23373 7590 01/15/2008 SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037				
			EXAMINER TRAN, TRANG Q	
			ART UNIT 2811	PAPER NUMBER
			MAIL DATE 01/15/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/591,585

Applicant(s)

KOBAYAKAWA ET AL.

Examiner

Trang Q. Tran

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 January 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 08/31/2006, 1/25/07, 7/27/07
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 101

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 3 - 4 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3 of copending Application No. 10/591584. Although the conflicting claims are not identical, they are not patentably distinct from each other. Present claims read on the claims or a combination of claims of copending Application No. 10/591584, and would be double patenting.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Yagi et al. (US Patent 6,297,442).

Re. claim 1, Fig. 5 of Yagi discloses the gallium nitride-based semiconductor device having a p-type layer that is a gallium nitride (GaN) compound semiconductor layer (21) containing a p-type impurity and exhibiting p-type conduction (Col. 6, lines 60-62), wherein the p-type layer comprises a top portion (21-a) and an inner portion (21-b) located under the top portion (21-a) and wherein the inner portion (21-a) contains the p-type impurity element and, in combination therewith, hydrogen (Col. 14, lines 6-8).

Re. claim 2, Yagi discloses the gallium nitride-based semiconductor device according to claim 1, wherein the p-type impurity is incorporated in the p-type layer by means of doping or ion injection (Col. 4, lines 37-39).

Re. claim 4, Yagi discloses the gallium nitride-based semiconductor device according to claim 1, wherein the inner portion (21-b) of the p-type layer (21) has a percent thickness of 40% to 99.9% with respect to a total thickness of the p-type layer (21) (Col. 5, lines 31-36).

Re. claim 5, Yagi discloses the gallium nitride-based semiconductor device according to claim 4, wherein the inner portion (21-b) of the p-type layer has a percent thickness of 70% or more with respect to the total thickness of the p-type layer (21) (Col. 5, lines 31-36).

Re. claim 6, Yagi discloses the gallium nitride-based semiconductor device according to claim 1, wherein the top portion (21-a) of the p-type layer has a hydrogen content that is $1/3$ or less the amount of the hydrogen contained in the inner portion (21-b) (Col. 4, lines 20-22).

Re. claim 7, Yagi discloses the gallium nitride-based semiconductor device according to claim 1, wherein the top portion (21-a) of the p-type layer has a hydrogen content that is $1/2$ or less the amount of the hydrogen contained in the inner portion (21-b) (Col. 4, lines 20-22).

Re. claim 8, Yagi discloses the gallium nitride-based semiconductor device according to claim 1, wherein the top portion (21-b) of the p-type layer has a hydrogen content that is $2/3$ or less the amount of the hydrogen contained in the inner portion (21-a) (Col. 4, lines 20-22).

Re. claim 9, Yagi discloses the gallium nitride-based semiconductor device according to claim 1, wherein the top portion (21-a) of the p-type layer has a hydrogen

content that is less than the amount of the hydrogen contained in the inner portion (21-b) (Col. 4, lines 20-22).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yagi.

Re. claim 3, Yagi does not expressly teach the gallium nitride-based semiconductor device according to claim 1, wherein the inner portion (21-b) of the p-type layer has a ratio of atomic concentration of the hydrogen to that of the p-type impurity of about 1:1.

The inner portion (21-b) is selected the material from Group III-V (GaN) and the inner portion (21-b) is p-type and doped with Mg (Col. 5, line 13 and Col. 6, lines 60-62), which are the same with the disclosed invention. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the inner portion of the p-type layer has a ratio of atomic concentration of the hydrogen to that of the p-type impurity of about 1:1, in order to achieve the design properties.

Furthermore, it is well-understood in the art that the hydrogen or p-type concentration of order 10^{18}cm^{-3} to 10^{21}cm^{-3} . See example, DiLorenzo (US 3,762,945) Abstract.

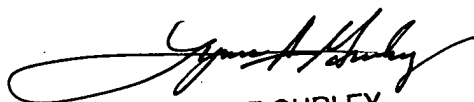
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Trang Q. Tran whose telephone number is 571-270-3259. The examiner can normally be reached on Mon - Thu (9am-5pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on 571-272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TT


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SUPERVISORY PATENT EXAMINER
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